

Dog therapy for children with zika syndrome: perceptions of mothers and professionals



Terapia com cães para crianças com síndrome do zika: percepção de mães e profissionais
Terapia con perros para niños con síndrome de zika: percepción de madres y profesionales

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ABSTRACT

Objective: To assess the perceptions of mothers and health professionals about the dog-assisted therapy for children with congenital Zika Virus syndrome.

Method: Qualitative, descriptive-exploratory research, with six mothers of children with congenital Zika Virus syndrome and six health professionals. Data were obtained at a Brazilian Specialized rehabilitation center in Paraíba, through semi-structured interviews, between February and October 2019. The empirical material was subjected to Inductive Thematic Analysis and interpreted using the Bronfenbrenner's Bioecological Theory.

Results: Dog-Assisted Therapy allowed the enhancement of skills that were previously not performed by children, such as: spontaneous hand opening, head control, improved social interaction, reduction of seizure episodes and disruption of spasticity patterns.

Final considerations: Dog-Assisted Therapy was perceived as qualified, humanized and satisfactory support for the evolution of the neuropsychomotor development of children with congenital Zika Virus syndrome.

Descriptors: Zika virus infection. Child health. Animal assisted therapy. Child development. Early intervention.

RESUMO

Objetivo: Apreender a percepção de mães e profissionais de saúde acerca da Terapia Assistida por Cães para crianças com síndrome congênita do Zika Vírus.

Método: Pesquisa qualitativa, descritivo-exploratória, realizada com seis mães de crianças com síndrome congênita do Zika Vírus e seis profissionais de saúde. Os dados foram obtidos em um Centro Brasileiro Especializado em Reabilitação na Paraíba, por meio de entrevistas semiestruturadas, entre os meses de fevereiro e outubro de 2019. O material empírico foi submetido à Análise Temática Indutiva e interpretado à luz da Teoria Bioecológica de Bronfenbrenner.

Resultados: A Terapia Assistida por Cães possibilitou o aprimoramento de habilidades antes não executadas pelas crianças, como: abertura espontânea de mãos, controle cefálico, melhoria na interação social, diminuição dos episódios convulsivos e quebra de padrões de espasticidade.

Considerações finais: A Terapia Assistida por Cães foi percebida como um suporte qualificado, humanizado e satisfatório para a evolução do desenvolvimento neuropsicomotor das crianças com a síndrome congênita do Zika Vírus.

Descritores: Infecção por Zika vírus. Saúde da criança. Terapia assistida com animais. Desenvolvimento infantil. Intervenção precoce.

RESUMEN

Objetivo: Aprender la percepción de las madres y profesionales sobre la Terapia Asistida por Perro con niños con síndrome congénito del Virus Zika.

Método: Investigación cualitativa, descriptiva-exploratoria, realizada con seis madres de niños con síndrome congénito por el virus Zika y seis profesionales de la salud. Los datos fueron recolectados en el centro brasileño de rehabilitación especializado de Paraíba, a través de entrevistas semiestructuradas entre los meses de febrero y octubre de 2019. El material empírico fue sometido al Análisis Temático Inductivo y interpretado a la luz de la Teoría Bioecológica de Bronfenbrenner.

Resultados: La Terapia Asistida por Perro permitió mejorar habilidades que antes no realizaban los niños, tales como: apertura espontánea de manos, control cefálico, mejora en la interacción social, reducción de episodios convulsivos y ruptura de patrones de espasticidad.

Consideraciones finales: La Terapia Asistida por Perros fue percibida como un apoyo calificado, humanizado y satisfactorio para la evolución del desarrollo neuropsicomotor de niños con síndrome congénito del Virus Zika.

Descriptores: Infección por el virus zika. Salud infantil. Terapia asistida por animales. Desarrollo infantil. Intervención educativa.

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INTRODUCTION

Brazil has experienced a concerning public health problem due to the increase in the rates of rare congenital neuropathologies in newborns (NB), which resulted in an epidemic possibly associated with the Zika Virus (ZIKV)⁽¹⁾. This virus was identified in the placenta of fetuses with neurological alterations⁽²⁾. Most confirmed cases of Congenital Zika Syndrome (CZS) were born from 2015 to 2017, totaling 1,711 live births with CZS between 2015 and 2022. However, in subsequent years, confirmed cases showed a gradual and significant reduction⁽³⁾ to the point of requiring greater focus on monitoring/follow-up of children already affected than on the emergence of new cases.

In Brazil, 58.5% of the registered cases of newborns with microcephaly and/or alterations in the central nervous system associated with Zika virus infection occurred in the Northeast Region, mainly in the states of Pernambuco, Bahia and Paraíba⁽⁴⁾. The occurrence of microcephaly may be related to motor and/or mental alterations. However, most cases of microcephaly associated with ZIKV are accompanied by other brain alterations with cognitive impairment, which occurs in 90% of cases, and there may also be some impairment in sensory functions, such as hearing and vision, configuring CZS⁽⁵⁾.

It is essential to provide early follow-up and promote stimulation in children with CZS who have some delay in development, in order to improve their quality of life and to have as much independence as possible⁽⁶⁾. These children require healthcare that aims to reduce the consequences of this condition for child development (CD)⁽⁶⁾.

Care for children with ZIKV syndrome is challenging and the most common clinical symptoms are spasticity, irritability and seizures. A study showed that imaging tests with children (n=38) with CZS revealed that all of them had reduced brain volume. Intracranial calcification was observed in all individuals who presented irritability and seizures, and 83.3% of them had spasticity⁽⁷⁾.

The neurological impairment of children with ZIKV syndrome is severe, and it is essential to include differentiated and creative measures in the early stimulation process, since this stimulation acts on the development of motor, sensory, perceptive, proprioceptive, linguistic, cognitive, emotional and social areas. Thus, Dog-Assisted Therapy (DAT) is an alternative therapy that can be implemented in the early stimulation of children with ZIKV syndrome⁽⁸⁾.

DAT is a structured therapeutic intervention, which focuses on enjoying the benefits that exist in the bond between humans and dogs⁽⁹⁾. In line with this, a literature review on the benefits of DAT for the physical, organic and psychological

health of human beings showed that living with animals can lead to a reduction in blood pressure, lower stress levels, an increase in pleasure hormone levels in the body, in addition to being a motivator and promoter of a sense of security. The review also indicates that interaction with dogs can provide improvements, especially in reducing analgesics prescriptions and pain relief⁽¹⁰⁾.

The benefits are not unilateral, as the interaction between the dog and the human is also positive for the dog's well-being. Therefore, DAT promotes positive interactions between all involved because it has the potential to provide relaxation, comfort and calm for both the dog and children with disabilities^(9,10).

Since there is considerable mutual benefit in the bond between humans and dogs, this study aims to contribute to the theoretical deepening of DAT in the care of children with disabilities, especially those with congenital ZIKV syndrome, based on the perceptions of their main caregivers, mothers and health professionals. Considering that technological advancements currently result in social distancing, this research highlights the importance of interpersonal interactions and with nature. Therefore, the question is: "What are the perceptions of mothers and professionals regarding the implementation of DAT in children with ZIKV syndrome?"

Therefore, the study aims to understand the perceptions of mothers and health professionals regarding Dog-Assisted Therapy with children with congenital Zika Virus syndrome.

METHOD

Type of study and theoretical framework

This is a qualitative, descriptive-exploratory research, based on Bronfenbrenner's Bioecological Theory, which interprets development as a process of transformations and states that biopsychosocial factors influence human evolution according to four interacting elements: process, person, context, and time⁽¹¹⁾.

The "process" involves the relationship between person and context, contemplating all interactions and conditions of these interactions with some implication for the development of the individual; the "person" is the individual interacting with the context, according to their biopsychosocial characteristics, the "context" comprises all environments that influence the development and the "time" is the structure that encompasses the changes and stabilities of the person's development throughout life⁽¹¹⁾.

The manuscript was prepared following the Consolidated Criteria for Reporting Qualitative Research (COREQ)⁽¹²⁾.

Study Setting

The study was conducted at a Brazilian Specialized Rehabilitation Center (CER-IV) linked to the State Department of Education, a reference for habilitation and rehabilitation service in the four areas of disability (physical, intellectual, visual and auditory), for the entire state of Paraíba, where people with disabilities are treated by a multidisciplinary team.

Data source

The research participants were physical therapists, occupational therapists and mothers of children with Congenital Zika Virus Syndrome. Participant selection was intentional because it was necessary to include the main caregivers (mothers and professionals) of children relevant to the study.

The inclusion criterion for health professionals was: being responsible for the child's neuropsychomotor stimulation therapy sessions. It is worth noting that each professional worked within their theoretical scope and knowledge acquired throughout their practice, considering aspects that involved the appropriate planning and execution of the sessions, as well as the choice of material to be used, the definition of objectives and therapeutic strategies used during the sessions.

The inclusion criteria for mothers were: being a companion of a child diagnosed with the syndrome and being over 18 years old. The eligibility criteria for intervention participants were that they were children diagnosed with CZS, aged between two to three years, clinically stable, not allergic to animal fur and not uncomfortable with the presence of the dog.

Data collection and organization

Data were collected before and after the DAT sessions at CER-IV, between February and October 2019, through semi-structured interviews in a private location with only the study participant and the researcher present.

The main researcher was a female nurse working in Primary Health Care with experience in quantitative and qualitative research and had taken a dog therapy course in Fortaleza-CE to improve her knowledge on the subject. Initially, the researcher approached the institutions that would participate in the research and presented her ideas about what dog therapy is and its main benefits. Allowing children with ZIKV syndrome to enjoy the benefits of DAT was the main motivation for developing the study.

Subsequently, the research proposal was presented for approval by the philanthropic institution serving people with

disabilities in Paraíba to conduct the study and, through an official letter, the request was made to the commander for the services of the Paraíba Military Police Kennel (*Canil da Polícia Militar da Paraíba - PMPB*), which promptly provided two Labrador therapy dogs, duly trained and experienced in DAT. It is worth noting that this rehabilitation institution did not routinely perform DAT in its care dynamics until the time of the research.

The DAT sessions took place in climate-controlled room, with privacy and the necessary materials for therapy/stimulation, such as: cushions, myofascial release rollers, Swiss balls, toys, hula hoops, mirrors, tables and chairs, among others. To adapt the DAT, useful materials were made available to include the dog in the stimulation of the child, such as: dog brush, treats, balls and other toys.

The sessions did not follow a rigid sequence, so there was a certain dynamism to respect the needs of the child at each moment. However, the sessions started with the introduction of the dog to the child, who was properly positioned in the place where the DAT were performed. Subsequently, the professionals and the main researcher mediated the interaction by positioning both the animal and the child in a way that was most appropriate for the desired stimulation, whether by touching the child's hand on the animal's back (sensitive), offering the dog a treat so that the child could experience the animals tongue touching their hand, or by positioning the child above the dog when possible (provoking reactions and feelings in everyone involved), since the dog-child interaction deals with the unpredictable in a spontaneous and calm way, especially when involving trained dogs and a controlled environment with skilled professionals.

Sometimes, the researcher, immersed in the study, guided the interactions that could cause greater stimulation together with the physical therapists or occupational therapists and the professional responsible for guiding the dog.

The children participated in five DAT sessions, once a week, lasting 30 minutes, as agreed by the researcher with the therapists, so as not to negatively interfere with their work routine and to facilitate data collection. Thirty sessions were chosen - five for each of the six children participating in the study.

For the collection of empirical data, a semi-structured instrument was used before and after the DAT intervention, for both the professionals and the mothers. There was no repetition of interviews with the participants.

The interviews before the intervention were conducted in person only with the health professionals to identify the difficulties in carrying out conventional therapy and were guided by the question: 'Based on this child's routine therapy,

which stimuli do you perceive as having low responsiveness (poor outcome with therapy)?

After five sessions using DAT, new in-person interviews were conducted with the same professionals and the mothers of children with ZIKV syndrome, based on the following question: 'What changes in the child's development were identified after the intervention using DAT?'. These post-intervention interviews allowed for an understanding of the main benefits of DAT in caring for the children.

After the participants' consent, the interviews were audio-recorded and fully transcribed. Upon completion of each interview, the data were analyzed by the main researcher and a professor with experience in qualitative research. When both researchers agreed on the data's repetition and that they addressed the study's objective, the interviews were concluded. Therefore, the criterion adopted to end data collection was saturation.

Saturation sampling occurs when the content of the empirical material provides a comprehensive picture of the research objective, considering that the information collected is sufficient for analysis and discussion of the data⁽¹³⁾. The interviews lasted an average of 20 minutes and the transcripts were returned to the participants for content validation.

Data analysis

The data were analyzed using Inductive Thematic Analysis, which is a type of analysis used to identify, analyze, and report patterns in the data, as well as to minimally organize and describe the data set in detail⁽¹⁴⁾.

The analysis of the empirical data was conducted in six phases: familiarization with the theme (starting with the transcription of the interviews and subsequent active reading of the empirical material before searching for codes and meanings); generation of the initial codes (identification of sets of similar and recurring statements in the interviews for grouping initial codes manually); search for themes (selection of different codes in potential themes); review of themes (refinement of the thematic map, by reading all the data extracts, and the interrelationship between the themes); definition and naming of the themes (clear identification of the themes); and the production of the final text⁽¹⁴⁾, which, using Bronfenbrenner's Bioecological Theory⁽¹¹⁾, analyzed all the selected material for discussion and response to the objectives of this research.

Bronfenbrenner's Bioecological Theory⁽¹¹⁾ indicates that the process of individual transformations occurs reciprocally between their relationship and interaction with the various contexts or environments that are part of their life, influencing

their development. Therefore, this theory provides an understanding of how DAT can help in the treatment of children affected by ZIKV syndrome.

Ethical aspects

The study was approved by the Research Ethics Committee of the Health Sciences Center of the *Universidade Federal da Paraíba* under opinion no.3,058,440 (2016) and CAAE 02484818,4,0000,5188. Participants were invited to sign the Informed Consent Form (ICF) in two copies, to ensure the ethical recommendations established in Resolution no. 466/2012 of the National Health Council⁽¹⁵⁾.

To protect participants' anonymity, fictitious names of angels were adopted for the children, since the Association of Mothers of CZS Children is called the Association of Angel Mothers of Paraíba (*Associação de Mães de Anjos da Paraíba* - AMAP). The codenames were chosen randomly, namely: Gabriel's Mother; Miguel's Mother; etc. For the health professionals, the initial P was used, followed by the number corresponding to the interview sequence. For the dog, the codename "Friend with paws" was used.

RESULTS

A total of six healthcare professionals participated in the study - one male and five female - with ages ranging from 27 to 52 years old, including five physical therapists and one occupational therapist, with between two and a half to 27 years of experience in the institution.

The six mothers of children with CZS were aged between 26 and 30 years old, five of whom were married, and one was single. Their level of education ranged from seven to 14 years of study and all of them worked as housewives. No participant withdrew from the study.

From the data analysis, the following themes were identified: Difficulties in neuropsychomotor stimulation of children with Congenital Zika Virus Syndrome before the use of DAT and Changes in neuropsychomotor stimulation of children with Congenital Zika Virus Syndrome after the use of DAT.

Difficulties in neuropsychomotor stimulation of children with congenital Zika Virus syndrome before the use of Dog-Assisted Therapy

The emergence of a complex health demand arising from children with congenital Zika virus syndrome not only changed the lives of the children's families, but also led professionals to redefine their work process, as they were faced with a condition permeated by uncertainty.

The excerpts from the statements reveal the professionals' attitudes when faced with an unusual health condition that emerged in their work. To overcome the challenges presented by the new syndrome, they chose to treat each child according to the degree of neurological impairment they presented, in a comprehensive and gradual manner, always respecting their uniqueness.

[...] It was a challenge for us, so we have [...] since two months that we took these babies, today, it's been about three years of care, and we realize that in general these children have achieved [advances in treatment] according to the brain lesion, various forms of microcephaly [...]. (P2)

They arrived very early, around two or three months of age, and we are completing three years since the outbreak, and the children are attended according to the needs of each one. They grow and we make the modifications/adaptations that they need. (P1)

Due to the neurological impairment resulting from CZS, the professionals mention the great harm in the development of the children, who, at ages between two and three years, still presented persistent primitive reflexes, such as the palmar grasp reflex and the asymmetric tonic neck reflexes (ATNR), in addition to having no cervical control. These impairments possibly caused difficulties in therapies, which, when asked about the limitations they experienced in the therapeutic routine of each child with CZS, they highlighted:

Look, my main difficulty at the moment is mobilizing his neck because he has several primitive reflexes that have not yet been abolished, he does the ATNR all the time and this causes him to have a vicious posture in his cervical. (P6)

So, [...] what I have the most difficulty with is relaxing, especially in the upper limbs. They have a very large change in tone and most of them are spastic, you know? So, they had a very large change in tone, a very strong palmar grip, right. (P5)

Children with CZS present varied neurological symptoms. Some have, for example, variations in muscle tone (e.g. hypertonia and hypotonia). Therefore, according to the professionals who accompany them, these symptoms are different from those presented by patients diagnosed with other neurological disorders, such as cerebral palsy.

It is important to highlight the feeling of helplessness among professionals in the face of the child's poor progress

and the feeling that they are only helping to improve their quality of life, without prospects for improvement in the future. Additionally, due to the frequency of spasms and/or seizures, therapy sessions are often canceled and are often ineffective, because most of the time is spent stabilizing these occurrences.

[...] A huge tonic change, it is a different tone of a child with cerebral palsy. It's a very difficult tone to control, there's hypertonia and irritability is what hinders them the most. (P6)

[...] But he also has a lot of spasms all the time, a lot of hypertonia, it's that tone that fluctuates, you know?! [...] It's difficult, very difficult to treat him and I'm very honest, I don't see any significant improvement in him, what I'm doing at the moment is maintaining his quality of life, which could be worse. (P5)

[...] I think that one of the main difficulties we have is controlling convulsive crises [...] When a child has many repeated crises, we cannot manage it, they lose tone, they lose mobility, they lose all of this, so I think this puts difficulties for us, difficulty in positioning, in stretching. (P1)

Sensory impairment is another important factor, which was also mentioned as a difficulty in interacting with the child and doing the treatment. In this study, the reduced visual acuity of children with CZS was pointed out as a factor in the difficulty of early stimulation, as explained in the following statement:

[...] And there are also visual problems that greatly hinder balance development, so they have to do a lot of tasks as supporting. (P4)

Children are also unable to interact with the environment in which they are placed for stimulation, which is seen as an obstacle to carrying out conventional therapy.

[...] Some patients with severe cognitive impairment, therefore, do not respond with their look or with a smile, you know, it's an empty thing. Did you get it?! (P2)

He interacts a little. I think he is only able to spend more time in the room because of his mother, I think because of the interaction, sometimes he interacts with the sound and sometimes he gets irritated by the sound itself, he gets scared too. It depends on the moment, not every day he is collaborative, no, in fact there are few. (P5)

Changes in neuropsychomotor stimulation of children with Congenital Zika Virus Syndrome after the use of Dog-Assisted Therapy

In order to stimulate the development of children with congenital Zika virus syndrome, DAT was used as a complement to the conventional therapy performed by professional therapists. For this, the dog was introduced into the sessions according to the children's needs. Therefore, not only did the children have access to contact with the dog, but also the professionals and the mothers, who, at first, asked how it would be possible to use a dog as a therapeutic ally, reporting fear of the presence of the dog in the therapy:

I was afraid and kept wondering how would a dog help in the treatment? What was it going to do? It was all new to me and to Angel Miguel as well. (Angel Miguel's mother)

I was afraid because of the dog's fur and his sinusitis, so I thought it could get worse, but no, there was no reaction at all. (Angel Cherubim's mother)

When asked about the main changes observed after the sessions and the contact between the children and the therapy dogs, the mothers were satisfied with their children's progress because, before the DAT sessions, they were unable to move their upper limbs satisfactorily or make movements with their hands on their own. However, this situation changed when the children tried to pet the dog and there was also observed improvement in head control.

Moreover, the excerpts from the statements reveal that with dog therapy stimulated the children to make movements that their family members had never seen.

She tries to move her hands and arms more [...] And she is more eager to grab things, she opens her little hand like we did here in the dog therapy, which was the licking, right? with the dog. (Angel Uriel's mother)

[...] She opened her hand to grab the dog, she held her neck more to try to see the dog, for me it was really good. (Angel Cherubim's mother)

It was great because she had never had contact with any animal and the dog was good for her. Feeling the dog's fur made her move her little hand and foot on her own. It was good for her because when the dog moved, she moved too. She moved her little feet when they put her on top of the dog. (Angel Adriel's mother)

The professionals reported the children's progress achieved through DAT, as before, they had persistent reflexes

and, after implementing the therapy, they noticed significant motor gains and the possibility of achieving therapeutic goals, unlike what was observed when the children were stimulated with conventional therapy, without the presence of the dog:

[...] The issue of wrists too, there were children who came here with very strong hand and wrist flexor patterns, and we worked on that during the sessions. Now she is touching the dog, feeling the dog's fur, and that was a very positive point, quite satisfactory. And I have some patients who have improved hand opening where the pattern was broken [...], so today when she comes to me her hand posture is better and it makes my work easier, because we are now working on other postures for her to improve these postures, so the dog was very important in this objective. (P1)

He was interested [after the presence of the dog] in making some pincer movements that he didn't make before, so for me, those were the main ones. Angel Miguel had no pincer movement or ability to reach for objects. And he achieved this during the therapy because he was interested in touching the animal. So, everything was a win for me, both for me and for the mother, because the mother also noticed the differences. (P5)

Another benefit observed after therapy with the dogs was the reduction in seizure episodes. This is a noteworthy factor, because the constant seizures implied difficulties in handling the children for health professionals.

We noticed that the seizures decreased a lot, in fact they have stopped, he no longer has seizures. (Angel Seraphim's mother)

[...] he would have spasms, but during the sessions, I noticed that he would be very calm with the dog around, so these movements, when not abolished, were reduced. (P5)

The excerpts from the mothers' statements indicate an increase in interaction between the children and the dog, making them more interested in the environment around them, to the point of recognizing him and realizing that it was time to do something positive. The mothers also report the benefits of DAT in the home environment.

When we got to the door and he was going to come in, he wanted to go in right away, to see his friend with paws, to play with his friend with paws. (Angel Cherubim's mother)

He would smile whenever he was active with her (friend with paws) and I thought that was very beautiful, I also think he adapted a lot and improved. (Angel Gabriel's mother)

[...] I have a neighbor who has a dog, but I don't let him get too close because she sheds a lot of fur, but when he sees her (after the DAT) he gets all excited and kicks his legs. (Angel Miguel's mother)

Just like the mothers, the professionals also observed that the DAT, in addition to being a fun activity, improved the interaction between the children and the environment, through smiles, looks, expressions of happiness for recognizing the environment and understanding that there would be contact with the therapy dog.

[...] I saw his gratification in being there with the animal, so much so that when he arrived in the room, he was already anxious, with that awakening of "I'm going to see her (the dog), because he has a lot of affinity with the dog. So, this only increased that bond of satisfaction and his well-being of being there at that moment even more, he was already having a good interaction here in the room, right? So, it just reinforced that bond of affection and well-being during the therapy. (P3)

The dog brings something to the child beyond the playful aspect, some affection, something more, which awakened in him, because I saw an interest, I saw a sparkle in the child's eyes, so I used that to connect with the care, so for me, the friend with paws, she brought something playful that my care, music, noisy toys, none of that, resulted in as much gain (for the child) as I gained with the dogs. (P5)

■ DISCUSSION

Children with CZS need support, from basic home care to various types of therapy/assistance. Many children have difficulty performing daily activities, making them more prone to vulnerabilities, which can lead to worsening of the clinical condition⁽¹⁶⁾. As children grow, neurological symptoms begin to appear, usually between the second and third month of life, such as pyramidal/extrapyramidal syndrome, epileptic seizures and dysphagia⁽¹⁷⁾.

The clinical condition of children requires conventional therapies that should inhibit reflex movements. However, despite early stimulation, there was no improvement in the reduction of reflexes in some children. On the contrary, a

gradual increase in spasms triggered by tactile or auditory stimuli was observed, which resulted in convulsive crises followed by clonus or tremors⁽⁴⁾.

In this regard, healthcare professionals report that children with CZS have delays in motor development with the presence of hypertonia or spasticity, hyperreflexia, irritability and tremors that hinder the process of stimulating children⁽¹⁷⁾.

According to Bronfenbrenner's Bioecological Theory⁽¹⁸⁾, development is the product of the interaction between the evolving individual and the environment. From this perspective, a child's development is determined not only by biology or parental attention, but also by external influences.

Bronfenbrenner postulates that physical disabilities inhibit the affective engagement of individuals and hinder proximal processes (i.e., interactions that occur in the immediate environment) that should be motivated by the characteristics referring to physical, cognitive, emotional, social, and material aspects of the person⁽¹⁸⁾. This is corroborated by the reports of professionals, who demonstrate some frustration with the stagnation of the development of these children, before performing the DAT, without envisioning a perspective of improving the prognosis, only a hope of improving the quality of life, but without expectation of therapeutic strategies that could be used to change this reality⁽¹⁹⁾.

However, after performing the DAT, mothers and professionals reported renewed hope, as they observed progress in the development of the child with CZS never seen before, which involved several aspects of neuropsychomotor development.

A study⁽²⁰⁾ states that DAT can help children get involved in therapy and in the relationship between children and dogs, providing a sense of security during sessions and, thus, improving the child's participation in therapy activities.

Corroborating this aspect, a research⁽²¹⁾ conducted with 73 children with autism spectrum disorder showed that DAT had a positive impact on adaptive social communication skills, suggesting that DAT can serve as an effective model for establishing social interaction.

Therefore, this study observed a significant mitigation of the persistence of ATNR. Thus, the assistance of the dog may have enabled advances in child development, since by including DAT in the treatment, the child is stimulated and, at the same time, attracted to the dog, helping to interrupt this reflex. This finding is ratified by research conducted with DAT in autistic children, which also found advances in the development of the children studied⁽²²⁾.

The use of DAT implies other health benefits for the child. Firstly, contact with dogs can improve the child's immunity and their defenses against viruses and bacteria⁽²³⁾. Furthermore, based on the statements of the study

participants, it was observed that the children presented a better spontaneous opening of their hands after contact with the dogs' fur. Similar gains were also found in a study conducted with autistic children, whose parents reported improvements in motor coordination and balance after DAT⁽²⁴⁾.

It is noteworthy that a well-trained dog can serve as an excellent motivator for the development of gross and fine motor skills, through playful activities, such as brushing the animal and/or its teeth, playing ball and feeding the dog⁽²²⁾. These statements are supported by Bronfenbrenner's Theory, considering that dogs could fit into the immediate physical environment of children with CZS, where proximal processes are established, which are effective in acquiring skills or reducing dysfunctions and can stimulate attention, exploration, manipulation and imagination.

Beyond these aspects, the power of proximal processes tends to increase when there is a strong emotional relationship⁽¹⁹⁾. This type of connection explains the benefit of the bond between children and dogs. Furthermore, the Bioecological Theory postulates that development is related to aspects of the following systems: microsystem, concerning the family core; mesosystem, influenced by the environment in which the child lives and the interaction between them, such as family, professionals and the dog; exosystem, in which the child is not inserted, but can also intervene in its macrosystem, in which socioeconomic and cultural conditions are included^(18,24).

The interaction between the children and the dogs promoted a better receptiveness to the therapies, and it was possible to observe their smiles and expressions of enthusiasm, as evidenced in the statements of the study participants. The well-being induced during the DAT sessions occurred through the affectionate bond and harmony during the stimulation of the children.

A study conducted in Spain with 14 children between three and 12 years old diagnosed with physical and/or mental disabilities found that, after subjecting them to 12 DAT sessions with activities, exercises and games with the dogs, the children showed improvements in postural control, oculomotor coordination, expression of sensations and feelings, spontaneous interaction, autonomy and confidence⁽²⁵⁾. It is worth noting that children with CZS have an irritability that is characteristic of the syndrome, and the well-being fostered by DAT is beneficial not only for the child, but also for the family.

Although aware of the benefits of early stimulation, the mothers were fearful about using the dog, and did not understand that its presence could be positive for their child's treatment. Thus, the study provided greater knowledge about using dogs as an adjuvant in early stimulation and transcended barriers, changing perspectives regarding this activity.

The introduction of the dog into conventional therapy is emphasized as crucial for providing opportunities for previously unrealized maneuvers, which also facilitated the work of the involved healthcare team, improving the neuropsychomotor condition of the participating children.

This research brings contributions to teaching, research and, above all, to the management of nursing care, as it helps to disseminate the practice of DAT in the early stimulation of children with CZS, bringing the possibility of including this therapy in the different rehabilitation services that assist this group of vulnerable children. The health service in which the study was developed did not offer DAT services in its routine services, however, the continuity of this modality after the research was strongly considered. To the point that, currently, playful dog visits are carried out through a Non-Governmental Organization (NGO).

During the study, there were difficulties in completing the therapies with the dogs due to the illness and hospitalization of some children and challenges with the transportation of the mother-child binomial to the institution. Additionally, no software was used to manage the qualitative data.

■ FINAL CONSIDERATIONS

The dog-assisted therapy was perceived by the mothers and professionals as a qualified and humanized support, capable of generating satisfaction during its execution and contributing to the evolution of the neuropsychomotor development of children with CZS, as well as their quality of life.

Furthermore, according to the caregivers and professionals involved, the DAT brought positive impacts in the improvement of previously unperformed skills, such as spontaneous hand opening, better social interaction and a decrease in seizure events. Thus, this therapy emerges as an alternative for the treatment of these children, since it was noted that conventional therapy faced limitations and that, over time, its effectiveness decreased. Therefore, DAT is an efficient alternative for caring for children with Congenital Zika Virus Syndrome.

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